

MARCH 25, 1976

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ANNCR: THE VOICE OF AMERICA PRESENTS ... SCIENCE NOTEBOOK ... A SUMMARY OF EVENTS IN SCIENCE, MEDICINE AND TECHNOLOGY. EACH WEEK AT THIS TIME, WE BRING YOU REPORTS ON DEVELOPMENTS THAT MAY AFFECT OUR DAILY LIVES. WITH THE FIRST STORY, HERE IS YOUR SCIENCE EDITOR _____.
(U.S.-POLISH-YUGOSLAV STUDIES --3-3087 -- DOSA)

EDITOR: SCIENTISTS IN POLAND AND YUGOSLAVIA ARE PARTICIPATING IN AMERICAN-SPONSORED GEOLOGICAL STUDIES. HERE IS _____ WITH THE STORY.

VOICE: SOME OF THE MONEY THAT POLAND PAYS FOR WHEAT PURCHASES IN AMERICA IS BEING USED BY THE U.S. GEOLOGICAL SURVEY TO FINANCE POLISH COAL MINING STUDIES TO MEET SPECIFIC AMERICAN NEEDS. COAL HAS BEEN MINED FOR CENTURIES IN THE SILESIAN COAL FIELDS. BASED UPON THESE MANY YEARS OF EXPERIENCE, THE CENTRAL MINING INSTITUTE AT KATOWICE, POLAND, HAS ACCUMULATED VAST AMOUNTS OF DATA ON COAL CHARACTERISTICS, GEOLOGICAL CONDITIONS, AND THE EFFECT OF MINING ON THE WATER UNDER THE SURFACE OF THE EARTH.

THE POLISH SCIENTISTS HAVE BEEN COMMISSIONED BY THE U.S. GEOLOGICAL SURVEY TO DETERMINE HOW THE SILESIAN EXPERIENCE COULD BE APPLIED TO AMERICAN ENGINEERING AND ENVIRONMENTAL PROBLEMS. SUCH PROBLEMS ARE EXPECTED TO ARISE WITH THE PROPOSED MINING OF OIL SHALE, LIGNITE AND COAL IN THE WESTERN UNITED STATES.

VOICE: DOCTOR JOHN REINEMUND, CHIEF OF THE U.S. GEOLOGICAL
(CONT'D) SURVEY'S OFFICE OF INTERNATIONAL GEOLOGY, NOTED THAT
ACCORDING TO CURRENT THEORIES, ALL THE WORLD'S
CONTINENTS WERE ONCE JOINED TOGETHER IN ONE BIG LAND
MASS. THUS, HE SAID, "WHEN WE ASK POLISH GEOLOGISTS TO
SYNTHESIZE AND STUDY THEIR HUNDREDS OF YEARS OF COAL
RECORDS TO LOOK FOR A RELATIONSHIP BETWEEN THE
OCCURENCE OF COAL AND SUCH HEAVY METALS AS LEAD AND
ZINC, WE HAVE GOOD REASON TO BELIEVE THAT WE CAN LINK
THE GEOCHEMISTRY OF POLISH COAL TO U.S. COAL."

ALONG THE SAME LINES, THE U.S. GEOLOGICAL SURVEY IS
SUPPORTING AND USING THE RESULTS OF SEISMIC SURVEYS BEING
MADE IN YUGOSLAVIA. ACCORDING TO DOCTOR REINEMUND,
THE YUGOSLAV FINDINGS SHOULD HELP THE AMERICAN
GEOLOGISTS GAIN A BETTER UNDERSTANDING OF THE STRUCTURE
OF EARTHQUAKES. AND IN ANOTHER JOINT PROJECT,
YUGOSLAV GEOLOGISTS ARE DEVELOPING METHODS TO DETECT
AREAS WHERE UNDERGROUND CAVITIES MIGHT CAUSE THE LAND
TO SUBSIDE, OR SINK IN.

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(ANTICIPATING INFLUENZA -- 3-3087 -- DOSA)

EDITOR: PUBLIC HEALTH OFFICIALS FEAR THAT THE WORLD MAY BE
THREATENED BY A GLOBAL INFLUENZA EPIDEMIC COMPARABLE TO
THE ONE THAT TOOK A TOLL OF MILLIONS IN 1918. HERE
IS _____ WITH A REPORT ON WHAT
THE DOCTORS ARE TRYING TO DO ABOUT IT.

VOICE: THE 1918 EPIDEMIC WAS LARGELY CAUSED BY THE SO-CALLED SWINE-TYPE VIRUS. DURING THE RECENT INFLUENZA OUTBREAK IN THE UNITED STATES, TEN CASES OF THE SWINE INFLUENZA WERE REPORTED. EVEN THOUGH THIS IS A SMALL NUMBER, UNIVERSITY OF MICHIGAN INFLUENZA EXPERT, DOCTOR FRED DAVENPORT, HAS URGED PRODUCTION OF A SPECIAL SWINE-TYPE VACCINE AS A "LOGICAL AND PRACTICAL" MEASURE.

DOCTOR DAVENPORT IS CONFIDENT THAT SUCH A VACCINE COULD BE MADE BY THIS FALL TO FORESTALL THE POSSIBLE RECURRENCE OF THE 1918 EPIDEMIC. "WE HAVE KNOWN," HE SAID, "THAT INFLUENZA, WHATEVER ITS VIRAL STRAIN, IS CYCLICAL. IT THEREFORE MAKES SENSE TO BE PREPARED."

THE PROFESSOR, WHO IS CHAIRMAN OF THE UNIVERSITY OF MICHIGAN SCHOOL OF PUBLIC HEALTH'S DEPARTMENT OF EPIDEMIOLOGY, ALSO POINTED OUT THAT PRACTICALLY THE ENTIRE WORLD POPULATION UNDER AGE FIFTY LACKS NATURAL ANTIBODY PROTECTION AGAINST THE SWINE-TYPE VIRUS. AND HE WARNED THAT WITH THE REAPPEARANCE OF THE VIRUS -- EVEN THOUGH JUST A FEW PEOPLE HAVE CONTRACTED IT -- "IT MAKES EMINENT SENSE TO BE PREPARED."

UNIVERSITY OF MICHIGAN RESEARCHERS EXPERIMENTED WITH THE SWINE VACCINE BACK IN THE NINETEEN-FIFTIES. EXPERIENCE GAINED THEN HAS PROVIDED A VALUABLE BACKGROUND TO DEAL WITH A NEW INFLUENZA EMERGENCY. AND, CALLING THE PRESENT SITUATION AN "ALERT, NOT AN ALARM," DOCTOR DAVENPORT URGES STOCKPILING OF THE SWINE VACCINE.

VOICE:
(CONT'D) PROFESSOR DAVENPORT BELIEVES THAT IF A SWINE INFLUENZA OUTBREAK OCCURS, IT IS LIKELY TO HAPPEN IN OCTOBER. AND HE SAYS THAT "IT IS DIFFICULT FROM OUR YEARS OF EXPERIENCE WITH INFLUENZA OF ALL STRAINS AND WITH VACCINES OF MANY KINDS, NOT TO TAKE THIS MATTER SERIOUSLY."

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(NUCLEAR POWERED SATELLITE -- 3-3037-- DOSA)

EDITOR: A TITAN-THREE-CEE LAUNCH VEHICLE HURLED FOUR SATELLITES INTO SPACE FROM CAPE CANAVERAL ON MARCH FOURTEENTH. TWO OF THE SATELLITES ARE POWERED BY A NEW ATOMIC BATTERY. _____ HAS DETAILS.

VOICE: THE TWO EXPERIMENTAL COMMUNICATIONS SATELLITES BELONG TO THE UNITED STATES AIR FORCE. THEY ARE CAPABLE OF RELAYING MESSAGES BETWEEN GROUND STATIONS, EITHER DIRECTLY FROM POINT A TO SATELLITE ONE TO POINT B. OR, IN THE CASE OF MORE DISTANT GROUND STATIONS, BOTH SATELLITES ARE USED TO CARRY THE MESSAGE. THE SATELLITES CAN PROVIDE COMMUNICATIONS BETWEEN GROUND STATIONS IN AN AREA COVERING THREE-QUARTERS OF THE SURFACE OF THE EARTH.

THE NEW COMMUNICATION SATELLITES EACH CARRY TWO NUCLEAR POWER GENERATORS, DESIGNED TO PROVIDE TWO-HUNDRED-SIXTY WATTS OF ELECTRICITY CONTINUOUSLY FOR FIVE YEARS. THE GENERATORS HAVE NO MOVING PARTS, THEREFORE THERE IS LITTLE LIKELIHOOD OF A MECHANICAL FAILURE. THEY

VOICE:

(CONT'D) CONSIST OF A HEAT SOURCE AND A CONVERTER, BOTH PACKAGED INTO A STRONG CONTAINER DESIGNED TO PROTECT THE GENERATOR IN CASE OF ACCIDENT DURING THE LAUNCH.

THE HEAT SOURCE IS A PLUTONIUM ISOTOPE. AS THE ISOTOPE DECAYS, IT GENERATES HEAT WHICH WARMS UP HUNDREDS OF THERMOCOUPLES. THE THERMOCOUPLES -- TWO DIFFERENT KINDS OF METAL FASTENED TO EACH OTHER -- GENERATE ELECTRICITY AS THEY ARE EXPOSED TO HEAT.

NUCLEAR BATTERIES OF A SIMILAR NATURE, BUT WITH MUCH SMALLER POWER GENERATING CAPACITY, HAVE BEEN SENT INTO SPACE MANY TIMES. THEY ARE PROVIDING ELECTRICITY TO THE SCIENTIFIC INSTRUMENTS LEFT BY THE U.S. ASTRONAUTS ON THE MOON DURING THE APOLLO MISSIONS. THE TWO PIONEER SPACECRAFT WHICH HAVE FLOWN BY JUPITER AND ARE NOW HEADED TOWARD THE FAR REACHES OF THE SOLAR SYSTEM, AND BEYOND, ARE ALSO POWERED BY RADIOISOTOPE THERMOELECTRIC GENERATORS, AS THE ATOMIC BATTERY IS FORMALLY CALLED.

THE TWO COMMUNICATIONS SATELLITES WERE ACCOMPANIED INTO ORBIT BY TWO OTHER SPACECRAFT. THEY WATCH FOR DISTURBANCES CAUSED BY SOLAR X-RADIATION AND PARTICLE EMISSIONS IN THE IONOSPHERE WHICH MIGHT INTERFERE WITH RADIO COMMUNICATIONS.

(MARTIAN VOLCANOES -- 3-3087-- DOSA)

EDITOR: AMERICAN ASTROGEOLOGISTS -- SCIENTISTS DEALING WITH THE GEOLOGY OF OTHER PLANETS -- WERE SURPRISED TO LEARN THAT MARS HAS MUCH LARGER VOLCANOES THAN THE EARTH. HERE IS _____ WITH AN EXPLANATION.

VOICE: FIVE YEARS AGO, MARINER NINE SPENT A YEAR ORBITING AROUND MARS AND SENDING BACK THOUSANDS OF PICTURES OF ALMOST ITS ENTIRE SURFACE. ONE OF THE MANY SURPRISES REVEALED BY THESE PICTURES WAS THE PRESENCE OF GIGANTIC VOLCANOES THAT DWARF THEIR COUNTERPARTS ON EARTH. THE LARGEST MARTIAN VOLCANO, OLYMPUS MONS, IS MORE THAN TWO-AND-A-HALF TIMES TALLER THAN MOUNT EVEREST, THE HIGHEST MOUNTAIN ON EARTH.

ASTROGEOLOGIST MICHAEL CARR, OF THE U.S. GEOLOGICAL SURVEY, THINKS THAT THE BIG DIFFERENCE IN THE SIZE OF MARTIAN AND TERRESTRIAL (EARTHLY) VOLCANOES CAN BE EXPLAINED BY THE THEORY OF PLATE TECTONICS. THIS RELATIVELY NEW BUT GENERALLY ACCEPTED THEORY HOLDS THAT THE EARTH'S CRUST CONSISTS OF LARGE, RIGID PLATES THAT FLOAT OVER THE MANTLE.

THE EARTH'S MANTLE HAS HOT SPOTS IN IT AND WHEN A TECTONIC PLATE PASSES OVER A HOT SPOT, A VOLCANO IS BORN. LATER, AS THE PLATE MOVES ON, AWAY FROM THE HOT SPOT, THE VOLCANO DIES. OF COURSE, THIS LIFE CYCLE OF VOLCANOES OCCURS OVER A SPAN OF SEVERAL HUNDRED-MILLION YEARS.

VOICE:

(CONT'D) DOCTOR CARR BELIEVES THAT THE CRUST OF MARS IS TOO THICK. CONSEQUENTLY, IT HAD NOT BROKEN UP INTO TECTONIC PLATES, LIKE THE EARTH'S CRUST. AS A RESULT, A MARTIAN VOLCANO REMAINS FOREVER ON THE TOP OF A HOT SPOT, AND IT JUST KEEPS GROWING AS THE ERUPTING LAVA WIDENS ITS BASE AND ADDS TO ITS HEIGHT.

OLYMPUS MONS IS MORE THAN FIVE-HUNDRED KILOMETERS ACROSS AT ITS BASE, FOUR TIMES LARGER THAN MAUNA LOA ON THE ISLAND OF HAWAII, WHICH IS THE LARGEST VOLCANO ON EARTH. BUT THE MARTIAN VOLCANOES, DESPITE THEIR GIGANTIC SIZE, ARE MUCH LESS ACTIVE THAN THE TERRESTRIAL ONES. MAUNA LOA, FOR EXAMPLE, IS STILL QUITE ACTIVE AND, ACCORDING TO A RECENT ANNOUNCEMENT, IS EXPECTED TO PRODUCE A MAJOR OUTBREAK WITHIN THE NEXT TWO YEARS.

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WJL/PDH